

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,610	08/17/2001	Walter L. Winterbottom	9105-80	5085

7590

09/12/2003

Woodard, Emhardt, Naughton, Moriarty and McNett
Bank One Center/Tower
Suite 3700
111 Monument Circle
Indianapolis, IN 46204-5137

EXAMINER

TRAN, LEN

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 09/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-16

Office Action Summary	Application No.	Applicant(s)	
	09/932,610	WINTERBOTTOM ET AL.	
	Examiner	Art Unit	
	Len Tran	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-20,24-26,50-57 and 66-84 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☒ Claim(s) 1,5-9,11-20,24-26,66-74 and 76 is/are allowed.

- 6) ☒ Claim(s) 10, 50-57, 77-84 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.

- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 10, 50-54, 77-78, 81-84 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 841 406 A1.

EP '406 discloses the method of producing a semi solid without stirring comprising the steps of heating the metal alloy to form a metallic melt, regulating the amount of the metallic melt into a temperature controlled vessel, crystallizing the melt in the vessel by cooling the metallic melt at a controlled rate less than 0.5 degrees C per second to form a semi solid material having a microstructure comprising rounded solid particle dispersed in a liquid metal matrix (page 5, lines 45-54). The molten metal is transferred at a selected transfer temperature (table 3), about 25 degrees C above the liquidus temperature of the alloy (page 10, lines 1-10, page 8, lines 52-57), wherein the selected vessel temperature is between about 606 to 610 degrees Celsius (table 3). The metal alloy is heated to a temperature no greater than 40 degrees C above the liquidus temperature of the metal alloy to form the metallic melt (page 2, lines 14-21). The metal is transferred to an injection sleeve and directly transferred into a mold at a controlled rate

Art Unit: 1725

by regulating the displacement of the ram along the passage (figure 13). The ram displacement to inject the metal without turbulent flow is less than 50 inches per second (page 11, lines 15-20).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 55-57, 79-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '406 in view of EP 0 745 694 A1.

EP '406 discloses the claimed invention above in paragraph 2, but fails to teach transfer rate at 0.01 to 1 pounds per second, and the selected amount is 0.5 to 10 pounds, the solid

Art Unit: 1725

particles having diameter between 40 and 50 microns, the transferring, nucleating, crystallizing, and feeding occur within a total time of less than 60 seconds.

EP '406 fails to disclose transfer rate of between 0.01 pounds per second and about to 1 pounds per second in a total time of less than 60 seconds. However, EP '406 mentions of transferring the melted material into the vessel. The transfer rate should be as fast as possible, since the melted material should not be exposed outside the transfer element and the vessel too long in order to maintained the dendritic structure.

EP '406 fails to disclose the amount of transfer to be between 0.5 to 10 pounds. However, the amount would depend on the final product, whether the mold cavity can hold such quantity of metal for the specified shape.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have between 0.5 to 10 pounds of melted material, since this amount would depend on the final product's requirement.

EP '694 discloses the making of solid particles of less than 50 microns for the purpose of achieving a dendritic structure to promote the strength of the metal product (table 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide primary crystals in the range between 40 and 50 microns as taught by EP '694, in EP '406 in order to achieve a dendritic structure whereby result in a stronger cast material.

Allowable Subject Matter

6. Claims 1, 5-9, 11-20, 24-26, 66-74, 76 are allowed.

The prior arts of record fail to teach crystallizing the metallic melt in the vessel by cooling the melt at a controlled rate less than 0.5 degrees C per second without the use of a grain refiner and without mechanical agitation at any point during the crystallizing to form a semi solid material having a microstructure comprising rounded particles dispersed in a liquid metal matrix and having an average diameter no greater than about 50 microns.

Response to Arguments

7. Applicant's arguments filed 12/21/02 have been fully considered but they are not persuasive.

1. ***In page 10***, Applicant argues that in claim 10, the prior art of record fails to teach, "Controllably adjusted to a selected transfer temperature". However, examiner respectfully disagrees. The prior art of record implicitly disclose controlling the selected transfer temperature. If the transfer temperature is not maintained or controlled, the molten metal might pre-solidified if the temperature is too low. Therefore, claim 10 remains rejected.

2. ***In page 11***, Applicant argues that the *feeding of the metal is directly into the mold without transferring the semi solid material to an intermediate container*. However, examiner respectfully disagrees. In figure 13 of EP '406, the molten metal is not transferred to another intermediate container (180), but that 180 is actually the injection runner which is part of the injection process for introducing molten metal into the mold. Therefore, 180 is not an

Art Unit: 1725

intermediate mold, but that part of the mold. Applicant is claiming a shot sleeve, wherein molten metal is to be introduced into the mold, but yet argued that the molten metal is introduced directly into the mold. Hence, if the metal is to be introduced directly to the mold, then there is no purpose for the shot sleeve. Therefore, claims 50-57, 77-84 remain rejected.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Len Tran whose telephone number is (703)605-1175. The examiner can normally be reached on M-F, 8:30 - 5.


Art Unit: 1725

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 703-308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3602 for regular communications and (703)305-3602 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Len Tran
Examiner
Art Unit 1725

LT
August 7, 2003



M. ALEXANDRA ELVE
PRIMARY EXAMINER